

Big Ox's Certified Response to EPA's Clean Water Act Information Request

I certify that the following statements are accurate and that Big Ox has searched for and located the attached documents in its onsite and offsite records.

Pursuant to EPA's instructions, the certification statement form is attached to this response.

If Big Ox discovers any additional responsive data or information, Big Ox will supplement this response.

a. Question 1

Correspondence regarding this response should be sent to:

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b. Question 2

The qualified professional responding to these questions is:

Rob Ernest
General Manager, Big Ox Energy
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c. Question 3

A timeline of activities and events related to the Big Ox facility in South Sioux City, Nebraska is relayed below:

- June 2015: Ground breaking
- June – July 2015: Site preparations
- July 2015: Underground infrastructure

- August – October 2015: Foundations
- October 2015 – March 2016: Anaerobic digester and equalization walls
- November 2015 – March 2016: Processing building
- February 2016 – May 2016: Gas interconnect
- March 2016 – June 2016: Equipment installations
- April 2016: Utilities
- May 2016 – July 2016: Clean water testing
- June 2016 – Current: Equipment commissioning
- August 2016 – Current: Anaerobic digestion system seeding
- September 2, 2016: City wastewater influent flow
- September 2, 2016: Discharge of wastewater effluent to city sewer collection system
- October 19, 2016: Contractor employee injury working on Gas Energy Mixing (“GEM”) system
- November 1, 2016: Temporary discontinuance of city influent flow
- November 1, 2016: Temporary discontinuance of effluent to city sewer collection system
- November 2, 2016: Start of temporary truck conveyance of wastewater to Sioux City wastewater treatment plant
- December 14, 2016: Contractor employee injury installing pipe
- January 4, 2017: End of temporary truck conveyance of wastewater to Sioux City wastewater treatment plant
- January 4, 2017: Restart of city wastewater influent flow
- January 4, 2017: Restart of effluent flow to city sewer collection system
- January 8, 2017: Employee chemical exposure incident
- January 12, 2017: Trucking contractor employee fell from his truck
- Current: Operations running normally and production continues ramp up

d. Question 4

The facility is currently operating and is continuing to ramp up its operations to full function. Big Ox recommenced discharge of wastewater to the city sewer section on January 4, 2017, as described above, in lieu of the interim trucking of wastewater.

e. Question 5

Process flow diagrams are attached here as Exhibits D and F. Big Ox's process is explained in its application for an air permit as follows:

The Big Ox Energy Siouxland (BOES) facility will be located at 1616 D Avenue in Dakota City, Nebraska. The existing site where the facility will be located is a farm field. The new BOES facility will process wastewater and organic wastes from surrounding industries. The majority of wastewater will be delivered to the facility through three forcemains. The wastewater will be treated through a Dissolved Air Floatation (DAF) process and discharged through a forcemain to the municipal sanitary sewer. Solids removed from the DAF process and high strength wastes, received via truck at the site will be processed through an anaerobic digestion system. The biogas produced from the digestion process will be scrubbed, compressed and injected into the existing natural gas pipeline located adjacent to the site. Resultant solids will be dewatered and hauled-out as dewatered cake. The BOES facility will operate throughout the year, 24-hours a day and 7 days per week.

The process is described in more detail below based on liquid processing, solid waste processing, and the biogas system.

Liquid Processing

The wastewater from three forcemains will be collected in the Dissolved Air Flotation (DAF) Feed Tank. The wastewater from the DAF feed tank will be transferred to the DAF. The solids from the DAF will be sent to the Equalization/Mixing Tank. The effluent wastewater from the DAF will be sent to the sanitary sewer.

Solid Waste Processing

High strength wastes will be hauled in by truck and unloaded in the receiving area into two hoppers, receiving pits. The waste flows to a Receiving Tank. Packaged and canned food waste will also be hauled in and delivered to the facility at the

truck loading dock. The packaged waste will be unloaded into a Turbo Separator. The Turbo Separator separates the organic waste from the packaging material. The organic waste will be sent to the Receiving Tank and the packaging waste will be sent out for disposal.

The waste in the Receiving Tank will be pumped to the Mixing Tank. From the Mixing Tank, the contents will be transferred through a heat exchanger to Digester 1. From Digester 1, the contents will be transferred to Digester 2. From Digester 2, the contents will be sent to the digester effluent tank prior to dewatering.

Two centrifuges will be used to dewater the solids. The centrate from the centrifuges will be sent to the DAF Feed Tank and the solids from the centrifuges will be removed from the site as a dewatered cake via truck.

Biogas System

The biogas from Digester 1 and Digester 2 will be sent to a Biogas Cleanup Skid outside of the building to be scrubbed and injected into the natural gas pipeline. Scrubbed sulfur will be formed into crystalline sulfur solids which will be removed and washed in a filter press to produce a sulfur by-product for resale.

In the event the biogas cleanup skid is out of service, the biogas will be disposed of through a waste gas burner flare. Biogas will not be scrubbed prior to disposal into the waste gas burner flare.

The H₂S removal system will consist of a biogas scrubbing system for removal of H₂S. The H₂S will be converted into an elemental sulfur by-product for reuse or disposal. The scrubbed gas will be compressed in an electric powered gas compression system and direct injected into the natural gas transmission line located adjacent to the site. During compression the gas will be further scrubbed to concentrate the methane prior to injecting into the natural gas pipeline. This will result in a compressor tail gas that contains the unwanted portions of the compressed gas that will not be injected into the gas pipeline and will be directly

vented to the atmosphere. This tail gas will mainly contain CO₂ along with lesser quantities of methane and H₂S.

In the event that the biogas cleanup skid is not available, or otherwise cannot be injected into the gas line, the biogas will be directed to an industrial flare. The flare will be permitted for up to 500 hours per year of operation. There are no plans to vent biogas to the atmosphere without the gas either scrubbed by the biogas cleanup skid or combusted in the flare.

The facility will also include five (5) natural gas-fired boilers for generating process steam. The boilers will have a maximum fuel input rate of 800,000 Btu/hr, each. Three (3) natural gas-fired building heaters will be used to maintain adequate conditions within the processing area. Two (2) heaters will have a max fuel input rate of 2.25 MMBtu/hr, each and one (1) heater will be sized at 1.505 MMBtu/hr.

An natural gas fired emergency generator will be installed to provide power to the facility in the event that power for the pumps for the forcemains or other plant systems, is not available.

f. Question 6

The wastewater treatment flow diagram is attached here as Exhibit D. Big Ox is not required to and so does not use any H₂S removal equipment.

g. Question 7

Big Ox has never had a process upset that has halted the production of biogas. To our knowledge, there has been no process upset that would result in any violation of any applicable federal or state air standard.

h. Question 8

Contracts with entities providing incoming materials; receiving, purchasing, or using finished products produced by the Big Ox facility; or receiving waste are attached as Exhibit G.

i. Question 9

Available information on incoming materials to the facility since August 1, 2016 is attached here as Exhibit H.

j. Question 10

Available information on the facility's wastewater generated since August 1, 2016 is attached here as Exhibit I.

k. Question 11

Big Ox has no wastewater monitoring and sampling data to provide because this testing is done by the municipality of Sioux City, Iowa.

l. Question 12

The tipping agreement between Big Ox and South Sioux City, Nebraska is attached as Exhibit B.

m. Question 13

Billing agreements between Big Ox and Sioux City, Iowa are attached as Exhibit J.

n. Question 14

Billing records for charges for water usage and charges for wastewater discharges are attached here as Exhibit K.

o. Question 15

The Technical Memorandum (attached as Exhibit L) outlines a start-up plan for the use of the bypass forcemain and other adjustments made within the facility to address the hydrogen sulfide issues.

With respect to the community, Big Ox temporarily halted discharges to the sewer system between November 1, 2016 and January 4, 2017; meanwhile, Big Ox proactively initiated a comprehensive investigation of the root cause of all issues and problems. Big Ox offered to pay for the costs of

affected residents to stay at a local hotel while the issue was investigated and resolved. Big Ox hired an outside environmental firm, Haley & Aldrich, and the global engineering firm Black & Veatch. Big Ox also hired the outside certified industrial hygienists at NJ & Associates to test for the presence of H₂S in the homes of all residents who complained of odors. Big Ox has been using this extensive team to make sure that residents in the local area are safe and do not face H₂S impacts. Finally, Big Ox financed an approximately \$1 million project, completed in the span of only six weeks, to construct a new sewer line rerouting the wastewater flow away from residential areas.

p. Question 16

Available copies of correspondence related to H₂S between Big Ox and South Sioux City, Nebraska are attached here as Exhibit M.

q. Question 17

Big Ox has no engineering studies required by the Clean Water Act or its implementing regulations to provide to EPA.

r. Question 18

Big Ox has no feasibility studies or engineering studies required by the Clean Water Act or its implementing regulations to provide to EPA.